

Title: Mathematical Monarchs

Brief Overview:

Through the study of Monarch butterflies students will be able to identify examples of symmetry and patterning. In addition, students will be able to demonstrate their ability to analyze and interpret data from a bar graph as well as create a circle graph from a given set of data including all necessary graph features. At the end of the unit students will be able to apply this knowledge to create a life-like model of a Monarch butterfly and write a letter including facts about the Monarch that will accompany their models to Mexico.

NCTM 2000 Principles for School Mathematics:

- . **Equity:** *Excellence in mathematics education requires equity - high expectations and strong support for all students.*
- . **Curriculum:** *A curriculum is more than a collection of activities: it must be coherent, focused on important mathematics, and well articulated across the grades.*
- . **Teaching:** *Effective mathematics teaching requires understanding what students know and need to learn and then challenging and supporting them to learn it well.*
- . **Learning:** *Students must learn mathematics with understanding, actively building new knowledge from experience and prior knowledge.*
- . **Assessment:** *Assessment should support the learning of important mathematics and furnish useful information to both teachers and students.*
- . **Technology:** *Technology is essential in teaching and learning mathematics; it influences the mathematics that is taught and enhances students' learning.*

Links to NCTM 2000 Standards:

. **Content Standards**

Number and Operations

- . *Understand numbers, ways of representing numbers, relationships among numbers, and number systems; recognize equivalent representations for the same number; develop understanding of fractions as parts of unit wholes, as parts of a collection.*
- . *Understand meaning of operations and how they relate to one another.*
- . *Compute fluently and make reasonable estimates; and select appropriate methods and tools for computing with whole numbers from among mental computation, estimate, and paper and pencil according to the context and nature of the computation and use the selected method or tools.*

Algebra

- . *Understand patterns, relations, and functions; and represent and analyze patterns and functions, using words and graphs.*
- . *Use mathematical models to represent and understand quantitative relationships; and model problem situations with objects and use presentations such as graph, models and equations to draw conclusions.*

Geometry

- . *Analyze characteristics and properties of two-and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships; identify, compare, and analyze attributes of two- and three-dimensional shapes and develop vocabulary to describe the attributes; classify two-and three-dimensional shapes according to their properties and develop definitions of classes of shapes such as triangles and trapezoids; investigate, describe; explore congruence and similarity; and make and test conjectures about geometric properties and relationships and develop logical arguments to justify conclusions.*
- . *Apply transformations and use symmetry to analyze mathematical situations; predict and describe the results of sliding, flipping, and turning two-dimensional shapes; describe a motion or a series of motions that will show that two shapes are congruent; and identify and describe line and rotational symmetry in two- and three- dimensional shapes and designs.*
- . *Use visualizations, spatial reasoning, and geometric modeling to solve problems; build and draw geometric objects; create and describe mental images of objects, patterns, and paths; identify and build a three-dimensional object from two-dimensional presentations of that object; identify an draw a two-dimensional representation of a three-dimensional objects; use geometric models to solve problems in other areas of mathematics, such as number and measurement; and recognize geometric ideas and relationships and apply them to other disciplines and to problems that arise in the classroom or in everyday life.*

Measurement

- . *Understand measurable attributes of objects and the units, systems, and processes of measurement; understand such attributes as distance and time and identify the type of unit for measuring each attribute; understand the need for measuring with standard units and become familiar with standard units in the customary and metric systems; carry out simple unit conversions, such as from days to weeks, within a system of measurement; understand that measurements are approximate and how differences in units affect precision.*
- . *Apply appropriate techniques, tools, and formulas to determine measurements; select and apply appropriate standard units and tools to measure time and distance; and select and use benchmarks to estimate measurements.*

Data Analysis and Probability

- . *Formulate questions that can be addressed with data and collect, organize and display relevant data to answer them; collect data using observations, and experiments; and represents data using tables and graphs such as: bar graphs and circle graphs.*
- . *Select and use appropriate statistical methods to analyze data; describe the shape and important features of a set of data and compare related data sets, with an emphasis on how*

data are distributed; and compare different representations of the same data and evaluate how well each representation shows important aspects of the data.

- . Develop and evaluate inferences and predictions that are based on data; and propose and justify conclusions and predictions that are based on data and design studies to further investigate the conclusions or predictions.*

. Process Standards

Problem Solving

- . Instructional programs from pre-kindergarten through grade 12 should enable all students to build new mathematical knowledge through problem solving; solve problems that arise in mathematics and in other contexts; apply and adapt a variety of appropriate strategies to solve problems; and monitor and reflect on the process of mathematical problem solving.*

Reasoning and Proof

- . Instructional programs from pre-kindergarten through grade 12 should enable all students to recognize reasoning and proof as fundamental aspects of mathematics; make and investigate mathematical conjectures; develop and evaluate mathematical arguments and proofs; and select and use various types of reasoning and methods of proof.*

Communication

- . Instructional programs from pre-kindergarten through grade 12 should enable all students to organize and consolidate their mathematical thinking through communication; communicate their mathematical thinking coherently and clearly to peers, teachers, and others; analyze and evaluate the mathematical thinking and strategies of others; and the language of mathematics to express mathematical ideas precisely.*

Connections

- . Instructional programs from pre-kindergarten through grade 12 should enable all students to recognize and use connections among mathematical ideas; understand how mathematical ideas interconnect and build on one another to produce a coherent whole; and recognize and apply mathematics in context outside of mathematics.*

Representation

- . Instructional programs from pre-kindergarten through grade 12 should enable all students to create and use representations to organize, record, and communicate mathematical ideas; select, apply, and translate among mathematical representations to solve problems; and use representations to model and interpret physical, social, and mathematical phenomena.*

Links to National Science Education Standards:

. Unifying Concepts and Processes

The students will be given the opportunity to observe patterns and symmetry in nature. They will also gain understanding of the life cycle and the need for migration in order to perpetuate the species.

- . **Science as Inquiry**

The students will be given the opportunity to develop their own theories regarding the migration of the Monarch butterfly.

- . **Physical Science**

The students will be given the opportunity in Day 5 to create a life-like model using crayons and incorporating symmetry.

- . **Life Science**

The students will be given the opportunity to study the migration pattern of the Monarch and other animals as well as replicate the Monarch's migration with the model they have constructed.

Grade/Level:

Grade 2

Duration/Length:

Approximately six days of 50-60 minute sessions

Prerequisite Knowledge:

Students should have working knowledge of the following skills:

- . Knowledge and/or exposure of numbers up to 1000
- . Identifying and creating simple patterns
- . Symmetry
- . Relationship of days to weeks to years
- . Using a rubric
- . Skip counting
- . Recognition of a graph
- . Basic knowledge of shapes or experience with pattern blocks

Student Outcomes:

Students will be able to:

- . Create a pattern
- . Identify and continue a pattern
- . Identify objects or pictures as symmetrical or asymmetrical using a line of symmetry
- . Complete a circle graph and include all necessary graph features
- . Read a graph and interpret the data to answer a set of given questions
- . Write a letter including facts learned about the Monarch
- . Construct a life-like model of a Monarch incorporating both symmetry and Patterning

Materials/Resources/Printed Materials:

- . The Caterpillar and the Polliwog by Jack Kent
- . Monarch Butterfly by Gail Gibbons
- . The Butterfly Alphabet by Kjell Sandved (*see Extension activities*)
- . Teacher Resource Sheets # 1 - 4
- . Student Resource Sheets # 1 - 6
- . Ruler (one per student)
- . Magazine clippings of people (*see Day 3*)
- . Crayons
- . Overhead pattern blocks
- . Pattern blocks (enough for each student or pair of students)
- . Easel with chart paper
- . Chart markers
- . Overhead projector and markers
- . Transparencies of all Resource Sheets
- . *Access to the Internet (encouraged for Extension activities)*

Development/Procedures:

Day 1 - Symmetry

- . Gather the students on the carpet or at your designated reading area. Have an easel or chart within reach.
- . Show them the cover of The Caterpillar and the Polliwog by Jack Kent.
- . Ask what they know about caterpillars and polliwogs.
- . Tell them (if someone doesn't say it) that they have something in common.
- . Tell them that they are going to read to find out what it is. (You can ask students to raise their hands when they identify what they have in common.)
- . Read the book. (As students raise their hands you can stop to listen to their thoughts, or you can have them save them to the end.)
- . After reading the story discuss what caterpillars and polliwogs have in common. (They both change into something.)
- . Ask students what the polliwog turn into? (frog) What did the caterpillar turn into? (butterfly)
- . Ask students if they notice anything about the butterfly's wings. Steer them to the fact that they are the same/symmetrical.
- . Ask the students if anyone knows what it is called when either sides or parts of something are the same. If not, introduce the word symmetrical.
- . Write the word on your easel or chart. This word should also be added to your math word wall.
- . Ask students if they can think of other examples of symmetrical objects. Listen to their responses and talk about them.
- . Tell students that you are going to show pictures and they should give thumbs up if they think it is symmetrical and thumbs down if it is not.
- . Display the picture cards (*Teacher Resource Sheet # 1*) one by one. Discuss why they are

symmetrical or asymmetrical. (You need to introduce this word, or you can continue to use the phrase not symmetrical.)

- . Once you have shown all of the cards and you feel comfortable with their understanding, tell the class that they are going to evaluate some other examples independently.
- . Distribute *Do You See Symmetry* (*Student Resource Sheet # 1*). You should also have an overhead of this sheet. Tell the students that you are going to do the first two together and that you are going to teach them a trick or strategy for identifying symmetry.
- . Once all of the students have their worksheet in front of them, begin by having them lay their pencil down on their desk on top of number one. Model this on the overhead. Place the pencil over the dotted line and show them how the pencil cuts the picture in half. If both sides are the same, the picture is symmetrical. This line is called the line of symmetry. Have the students repeat that phrase. They can now use their pencil not only to determine if something is symmetric, but also where the line of symmetry is!
- . Move to number two. Have students place their pencil on the house. Ask students if there is anyway you can move the pencil so that both parts of the house are the same. Model moving the pencil on the overhead. After some wait and practice time, call on a student to answer.
- . Discuss why this is not symmetrical. Clear up any confusion. Have students move to number three. Depending on your class you can have the students do one at a time, with you stopping them at each to check, or you can have them work independently.
- . When students have completed worksheet have students come back to the carpet and discuss what they have learned about symmetry. Have students turn to a partner and share how they know something is symmetric. You could have pairs check their work together also.

Day 2 - Patterns

- . Gather the students on the carpet or at your designated reading area. Have an easel or chart within reach. Draw a basic pattern on the chart, such as Ask students if they know what this is. (A pattern.) Talk about what a pattern is. Ask them what would come next in this pattern.
- . Draw a more difficult pattern on the chart, such as A B # \$ A B. Ask students what would come next.
- . Ask the students if anyone can think of another type of pattern. (You can give examples to help them like a checkerboard.)
- . Tell the class that you are going to revisit the book they read yesterday, *The Caterpillar and the Polliwog* by Jack Kent. Yesterday they looked for symmetry and today they are going to see if they can spot a *pattern*. You can read the book again more quickly, or you can do a picture walk to look for patterns.
- . Stop on the page with the butterfly and ask students to identify the pattern on the wings.
- . Ask students what they notice about the pattern? (The colors and the shapes.) Tell the students that they are going to make their own patterns using pattern blocks.
- . Show a pattern block and ask the students if they have ever used them before. Allow students to have free exploration for five minutes.
- . Ask the students what they noticed about the blocks. This may be a bit of a review, but if it is you can speed it up. Go over the different colors, different shapes, etc.
- . Model a simple pattern on the overhead and have students create it on their desk. Repeat

being sure to include patterns which include a variety of blocks in terms of number and placement.

- . Using an overhead of *Student Resource Sheet # 2*, explain to the children that their job is to create a pattern for their butterfly using their pattern blocks.
- . Review with the children that in creating the pattern for their butterfly; they will need to remember the importance of symmetry. Using the overhead, lay a pencil down to represent the line of symmetry. Explain to the students that this will be used as a “starting point” for their pattern. Lay down a pattern block along one side of the line of symmetry. Then lay down another of the same block on the opposite side in an asymmetrical fashion. Ask the students whether this is symmetrical and if not, ask for a volunteer to move it to the correct position.
- . Continue with the modeling by then laying down another pattern block along the line of symmetry adjacent to the first block. Request assistance from a student in the placement of the next block to continue a symmetrical pattern.
- . Finish the modeling by laying down one pattern block at a time and being sure to model the placement of the matching block on the opposite side.
- . Distribute *Student Resource Sheet # 2* to each student. Advise the children that we will start the butterfly together. (You may choose to have the students work in pairs or alone.) Tell the children to choose one pattern block and lay it on a wing along the line of symmetry. Now have the children place the matching block on the line of symmetry on the other wing. Be sure to model this as some students may forget to place the second block as the mirror image of the first.
- . Continue to model the procedure using several more blocks and then allow the students to finish their butterfly patterns independently.
- . At the conclusion of the class, instruct the students to look at their butterflies and ask them to check to be sure their butterflies have wings with beautiful symmetrical patterns because they are going to have the opportunity to share them through a “Gallery Walk.” (The students may stand, push in their chairs, and then walk around the room to view the symmetrical designs created by their classmates.)

Day 3 – Life Cycle of the Monarch

- . Gather the students on the carpet or at your designated reading area. Have an easel or chart within reach. Show them the cover of Monarch Butterfly by Gail Gibbons.
- . Ask the students to think about what characteristics they notice about the wings of the butterfly on the cover. Review the terms *pattern* and *symmetry* relating them to the butterfly.
- . Ask the students what type of butterfly they think is pictured on the front of the book. (Point out the title again if needed.) Explain that the colors and pattern they see is typical of the Monarch butterfly.
- . Explain that the book they are going to read will share more information about the *life cycle* of the Monarch. Ask the children what a *life cycle* is. What are the stages of your life? (baby, child, teenager, adult)? How long are you in those stages? (The measurement of time in years will be important in discussion after the reading. You will be using these stages for comparison after the reading.)
- . Read Monarch Butterfly by Gail Gibbons. They should pay close attention because afterwards we will be comparing how the Monarchs’ *life cycle* compares to our own.

- . Compare life cycles! At this time teachers could show magazine clippings of people at different stages in their life and ask students to classify them based on their prior knowledge. See Human Life Cycle and Monarch Life Cycle (*Teacher Resource Sheets # 2 & 3*). (You may choose to copy this onto the board, chart paper, or use as an overhead.) Ask the children how their life cycles as humans compare to that of the Monarch's.
- . Ask the students to think about the stages of a Monarch's life or how an egg can turn into a butterfly using the information they learned about the life of the Monarch. Web that information. Try to "refer to the text" to identify the amount of TIME the Monarch spends in each stage of the cycle. This will be used in the next step.
- . Compare time! The children just discussed differences between the two life cycles including time. Now it's time to get specific! Ask the students what the smallest unit of time is in both of the life cycles discussed. (4 days-egg) Discuss the next biggest unit of time. (14 days-larvae/caterpillar and pupa) What is the next biggest unit of time? (8 months-adult butterfly) Compare unit of measurement used to measure butterfly life cycle versus time used to measure that of the human.
- . Conversion of measurements! Explain to the students that they are going to use the information they collected about the life cycle of the Monarch to create a circle graph that will show what fraction or portion of their lives are spent in each stage.
- . Display overhead of Life Cycle of the Monarch (*Student Resource Sheet # 3*) and give a copy to each student.
- . Explain that the amount of time that the Monarch spends in each stage has been given in days but the directions are asking students to find the number of **weeks** the Monarch spends in each cycle.
- . As a whole group, convert each of the measurements of time into weeks in order to complete the top of the worksheet. (Round the 4 days of the egg stage up to 1 week.) The use of number sentences may be helpful for this portion.
- . Explain to the class that the next portion of the worksheet is to actually use this information to create the circle graph (or pie graph) that will show the stages of the Monarch life cycle like slices of pizza or pie. Each line represents a week.
- . Ask the students whether they think that the egg stage is going to be a big or little slice of pizza and why? What will be the biggest? How do you think the other two stages will look?
- . Model completing the circle graph with the students. Please see Life Cycle of the Monarch (*Teacher Resource Sheet # 4*) for an example of the finished product.
- . To close, compare the web of the Monarch Life Cycle with the circle graph - Life Cycle of the Monarch. Ask students which is a better representation of the life cycle and why. (As an addition you could show the Human Life Cycle overhead and discuss what unit of measurement would be the best to use for creating a circle graph of the adult life cycle.)

Day 4 – Monitoring Migration

- . Gather the students on the carpet or at your designated reading area. Have an easel or chart within reach. Show them the cover of Monarch Butterfly by Gail Gibbons.
- . Review with the children the life cycle of the Monarch and the stage of the cycle in which the butterflies spend the most/least amount of time.
- . Ask students to think back to the adult stage of the cycle and identify something special that

happens at that time. (travel, migrate)

- . Discuss the term *migrate* and why the Monarchs would travel to Mexico. (The use of a map or globe as a visual reference would be beneficial at this time.) Discuss the details of the migration being sure to mention the mileage that the Monarchs travel as this is the basis for the graph work they will be doing on Monitoring Migration (*Student Resource Sheet # 4*).
- . Explain to the students that there are other animals that also migrate, but some might not travel as far as the Monarchs.
- . Display an overhead of Monitoring Migration (*Student Resource Sheet # 4*): *please note that this handout is two pages*. Review the animals that have migration in common with Monarchs. Have the students identify what differences or similarities they see in the graph from yesterday and the bar graph that is currently being displayed.
- . Interpret and analyze the data on the graph through verbal questioning such as: Which animal travels the furthest? Which travels the least? How far does the caribou travel?
- . Demonstrate the strategy of using a pencil to align the top of each bar to the mileage so that the students can identify the number of miles associated with each animal's migration.
- . Distribute Monitoring Migration (*Student Resource Sheet # 4*). Advise the children that they will continue using the graph as a resource as they answer questions pertaining to the graph.
- . When students have completed the worksheet, students should come back to the carpet and discuss whether it was hard or easy to read the graph. Ask students to discuss the strategies they used to find their answers.

Day 5 – Constructing Monarch Models

- . Teacher Introduction to Journey North: The Journey North project is located on the Internet at www.learner.org/jnorth/. During the following two days students are going to complete a paper model of a Monarch and write a letter to the Mexican student who will be caring for their Monarch. Creating the model requires the students to know that Monarchs are symmetrical and to know their coloring. The letter should include three facts about the Monarch that they have learned previously in this unit. Once they have completed both they can attach them and you send them to Journey North following the directions located on their website. In the spring you will get a group of butterflies returned to you that originated from all over the U.S.A. that have been cared for in Mexico all winter. (It is awesome!)
- . Gather the students on the carpet to introduce the “Journey North” project. Tell the students that they are going to create their own Monarchs and send it on its migration.
- . Revisit Monarch Butterfly by Gail Gibbons and talk to the students about the colors of the Monarch. Ask students what colors they see. Tell them that their Monarch needs to be those colors only.
- . Review the symmetry of the wings and what it means to be symmetrical.
- . Show the model that the students will be completing. Stress the importance of doing their absolute best because these butterflies are going to represent our school in Mexico.
- . Show the students that there is a rubric attached to their model. Pass out the blank *Monarch Model Student Resource Sheet 2* (this is the same handout used on Day 2 for patterning) and Monarch Model Rubric (*Student Resource Sheet # 5*) and review it. Tell students that they will be giving themselves a grade and then you will be giving them a grade. You can have them decide what should be done if the grades are different.
- . Students may return to their desks and begin their models.

Day 6 – Letters to Mexico

- . Gather the students on the carpet or at your designated reading area. Have an easel or chart within reach.
- . Explain to the students that yesterday they completed their models of their Monarchs using patterns and symmetry that will be sent to the students in Mexico. Today they will be writing the letters that will accompany their models that include at least three facts about the Monarch butterfly.
- . Brainstorm a list of facts about the Monarch butterfly that may be displayed for use during the writing process.
- . Review the correct form for a friendly letter.
- . Distribute the butterfly writing paper (located in the resource section) for children to begin writing. Keep in mind that while some students will be able to write this letter independently, you might have others that would be more successful working in a small group atmosphere and participating in an interactive writing session.

Performance Assessment:

- . Assessment is ongoing throughout this unit. On Day 1 you are assessing the students by listening to their responses on the carpet during the symmetry discussion. You can then observe the students as they complete their symmetry worksheet and when they have finished you have a concrete work sample. On Day 2 observation is your main mode of assessment. You are watching the students complete their Monarch model using the pattern blocks. During the gallery walk you can use a checklist as you walk around to note who completed the model correctly and who may need extra practice with patterns and symmetry. On Day 3 your opportunities of assessment are limitless. You will listen to their responses on the carpet when you are discussing and comparing the life cycles. Formal assessment will be their completed circle graph. On Day 4 you will have written responses to assess not only their ability to interpret data on a bar graph, but also make inferences based on that data. On Day 5 you will have the students' models and their rubric to assess the student. On Day 6 students' letters will serve as your assessment. (This is math so you are not assessing the letter writing.) However, the letter must include three facts that the student has learned about Monarchs.

Extension/Follow Up:

- . Visit Journey North website and view "Shivering Monarch" video clip and have students try shivering activity listed after the video. In this short video segment, students will see a Monarch butterfly shivering on a tree to keep warm. In the follow-up activity students are asked to partner up and time how long their partner can shiver, taking note of when their partner starts to tire or starts to sweat.
- . Read Butterfly Alphabet by Kjell Sandved and have students create a classroom butterfly alphabet book.
- . Place pattern blocks and blank Monarch model at a center and have students take turns placing a pattern block on each wing creating a symmetrical design (turning it into a game).

. **Authors:**

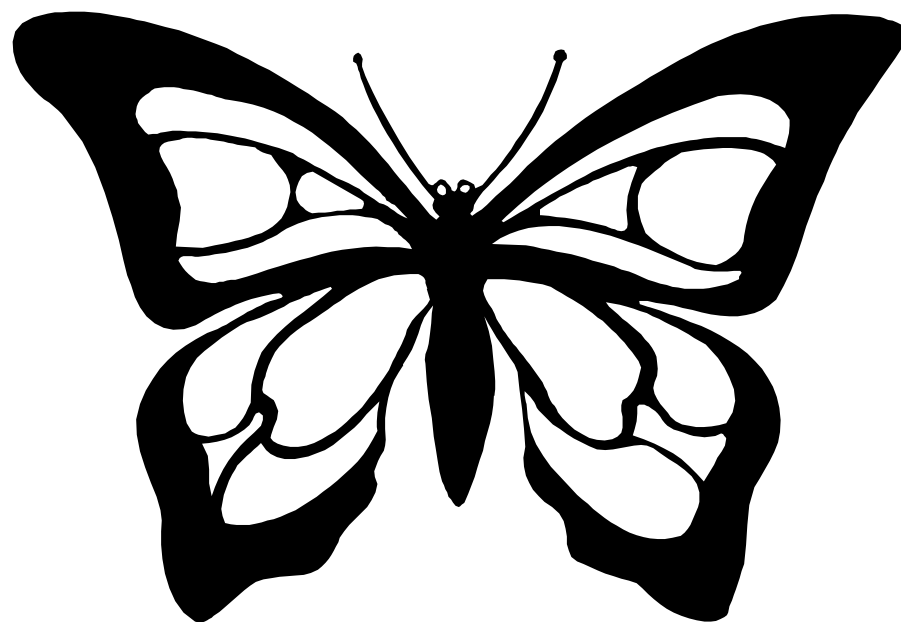
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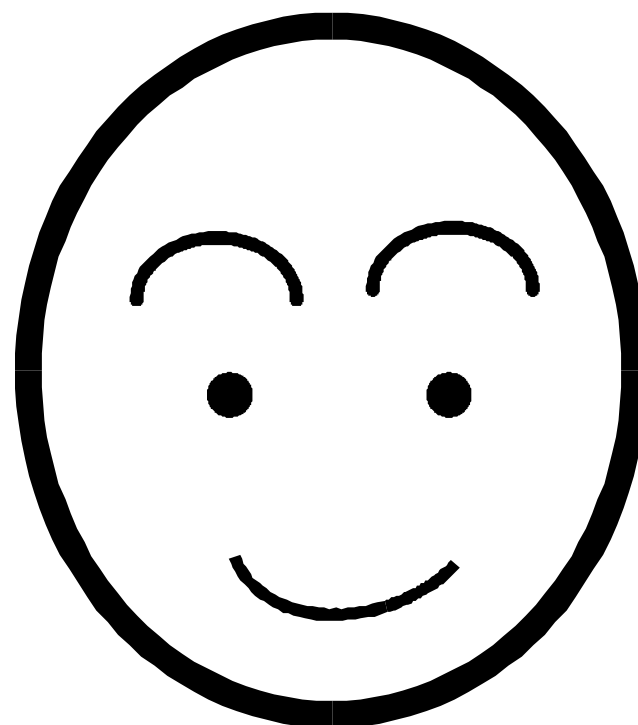
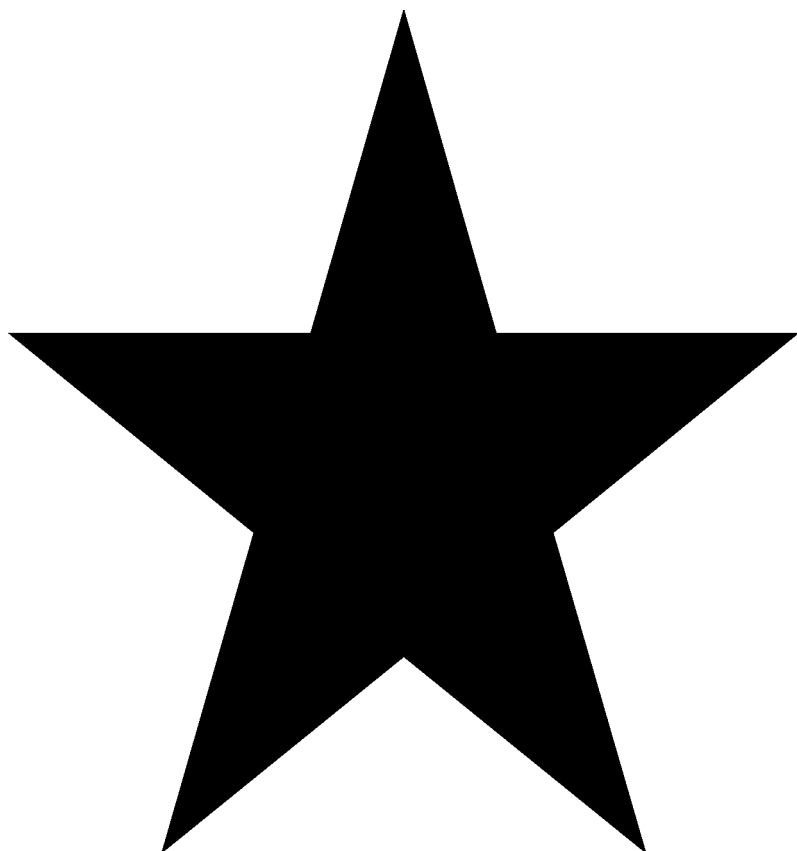
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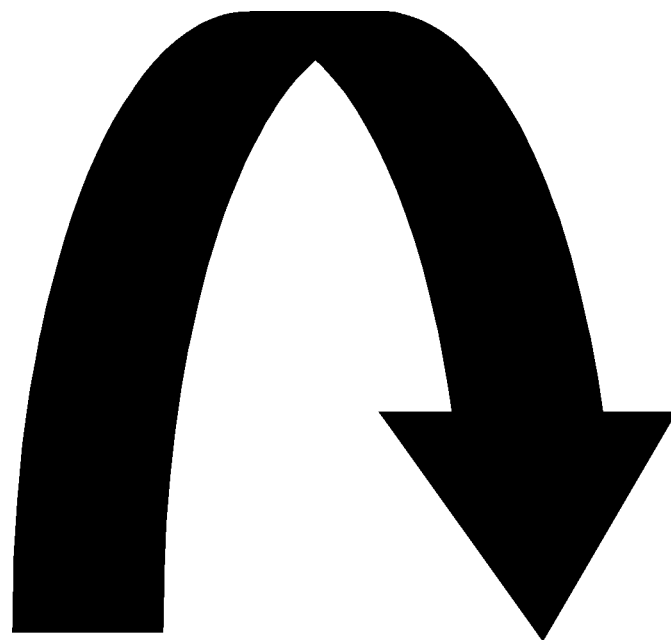
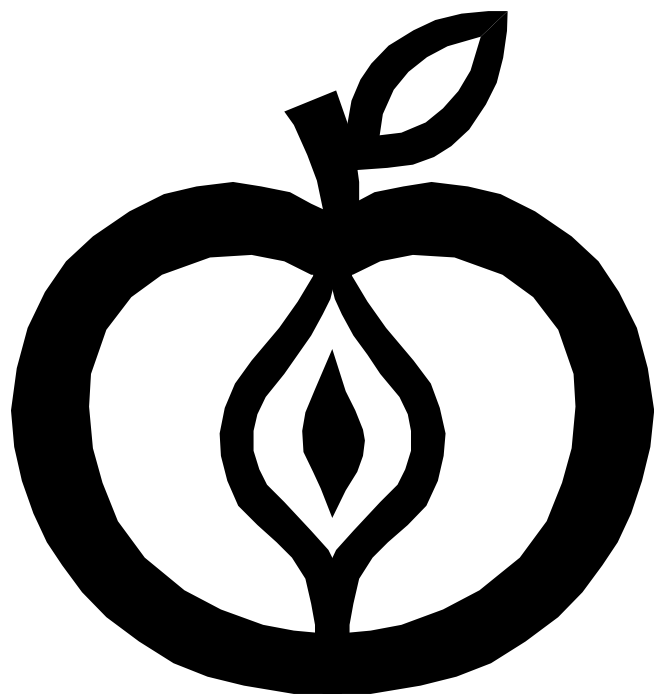
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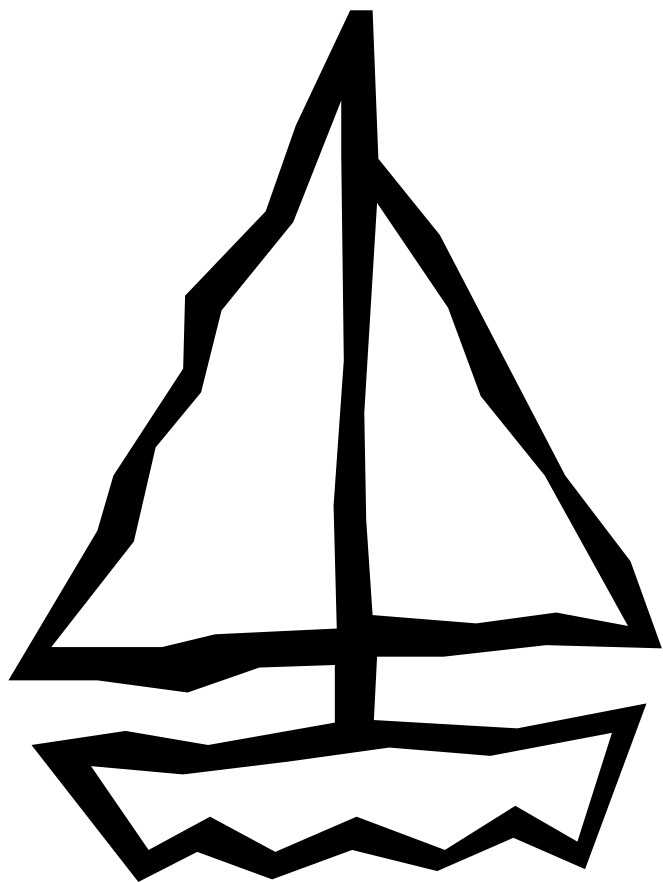
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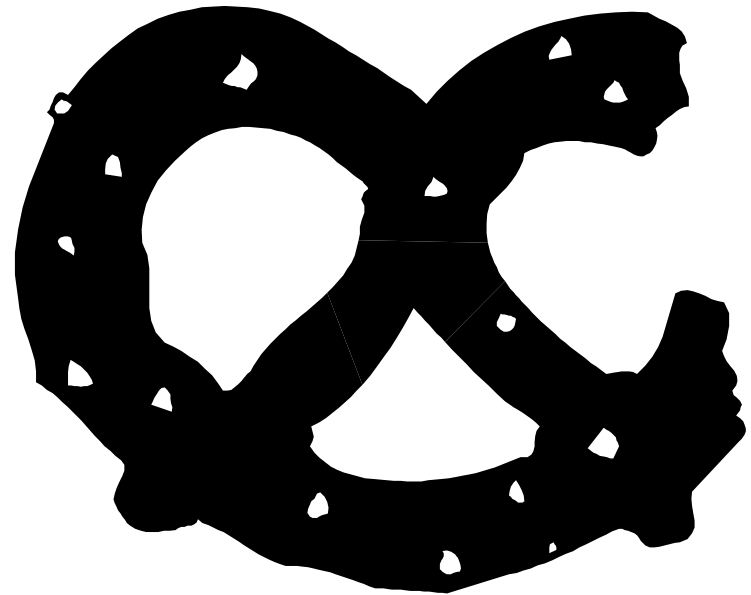
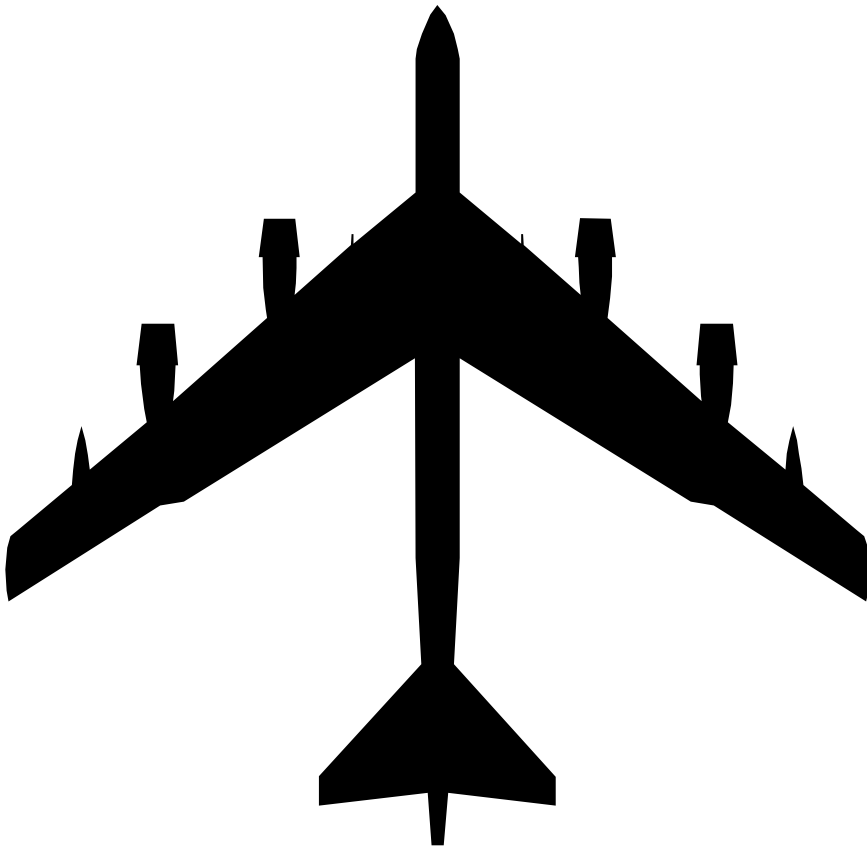
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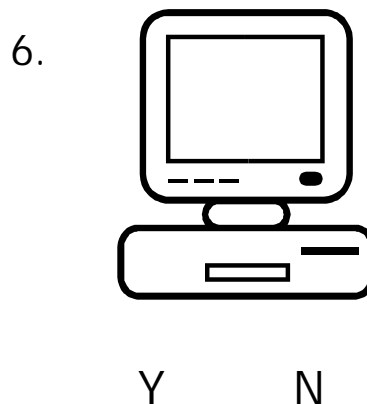
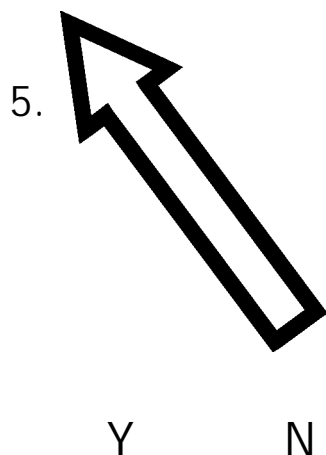
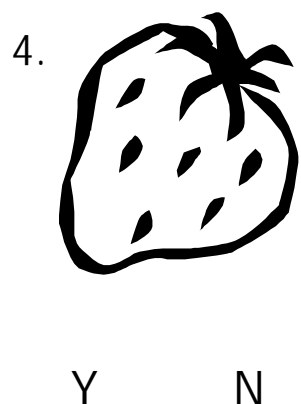
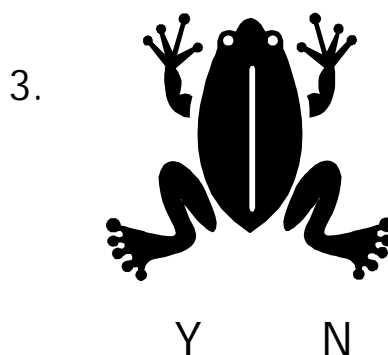
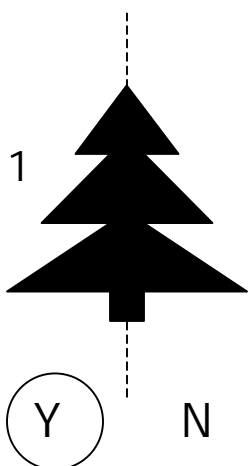


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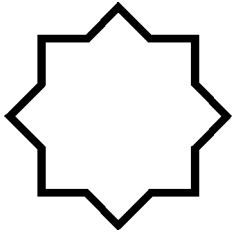
Student Resource Sheet # 1

DO YOU SEE SYMMETRY?

Directions: Look at each picture below. Do you see symmetry? If the object is symmetrical, circle the Y and draw the line or lines of symmetry. If it is not, circle the N. An example is done for you!



7.



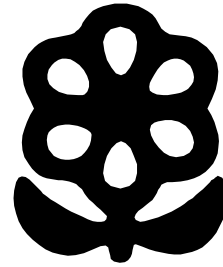
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8.



Y N

9.



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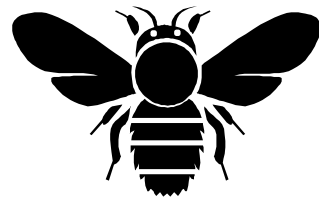
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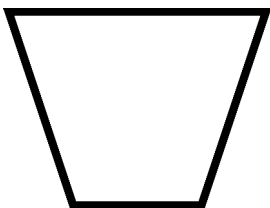
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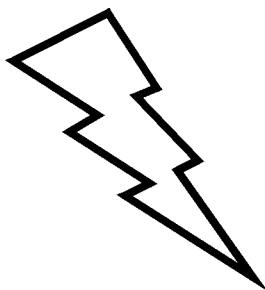
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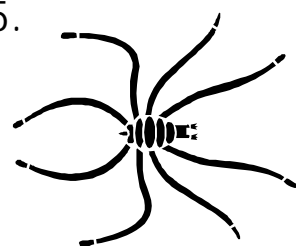
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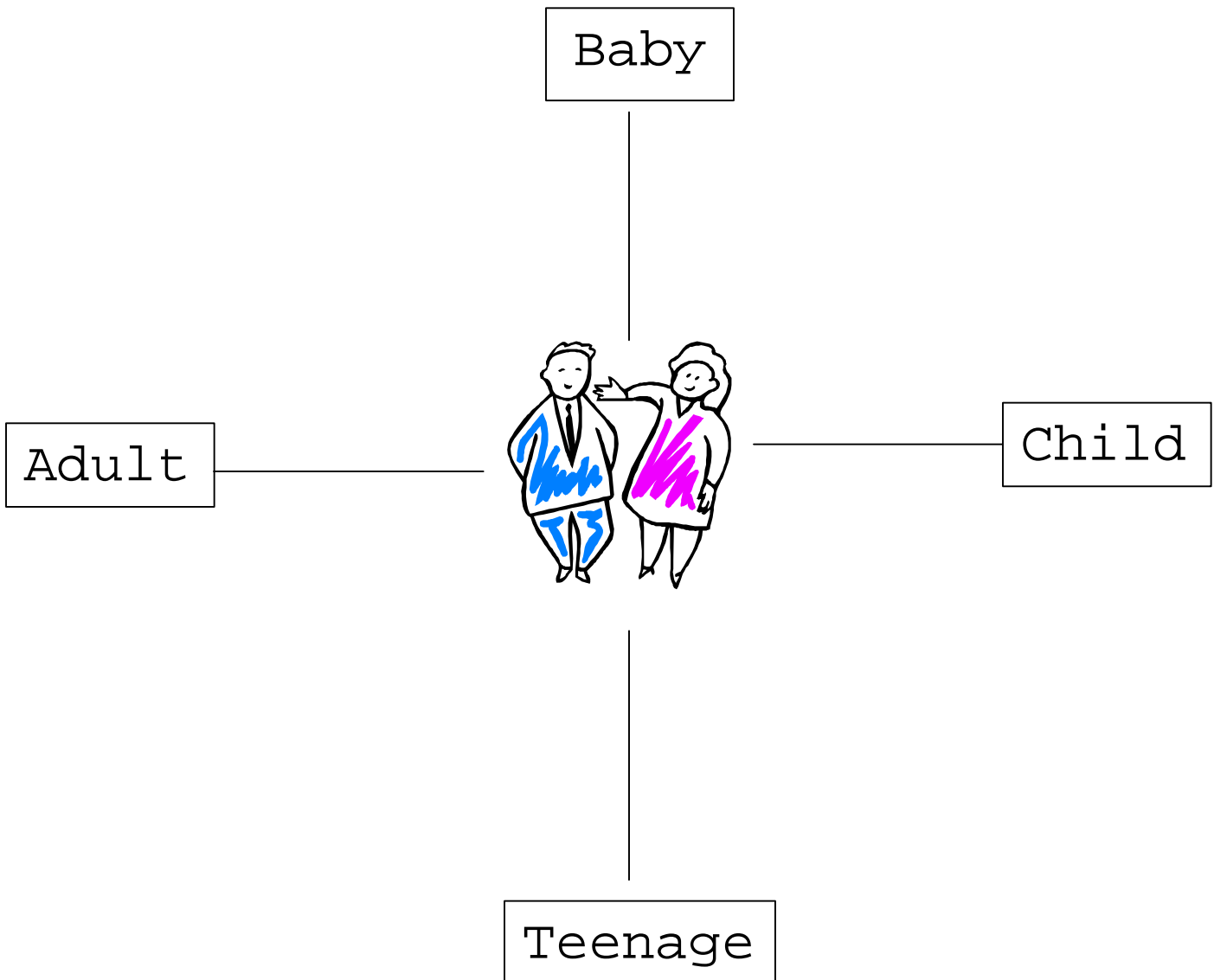
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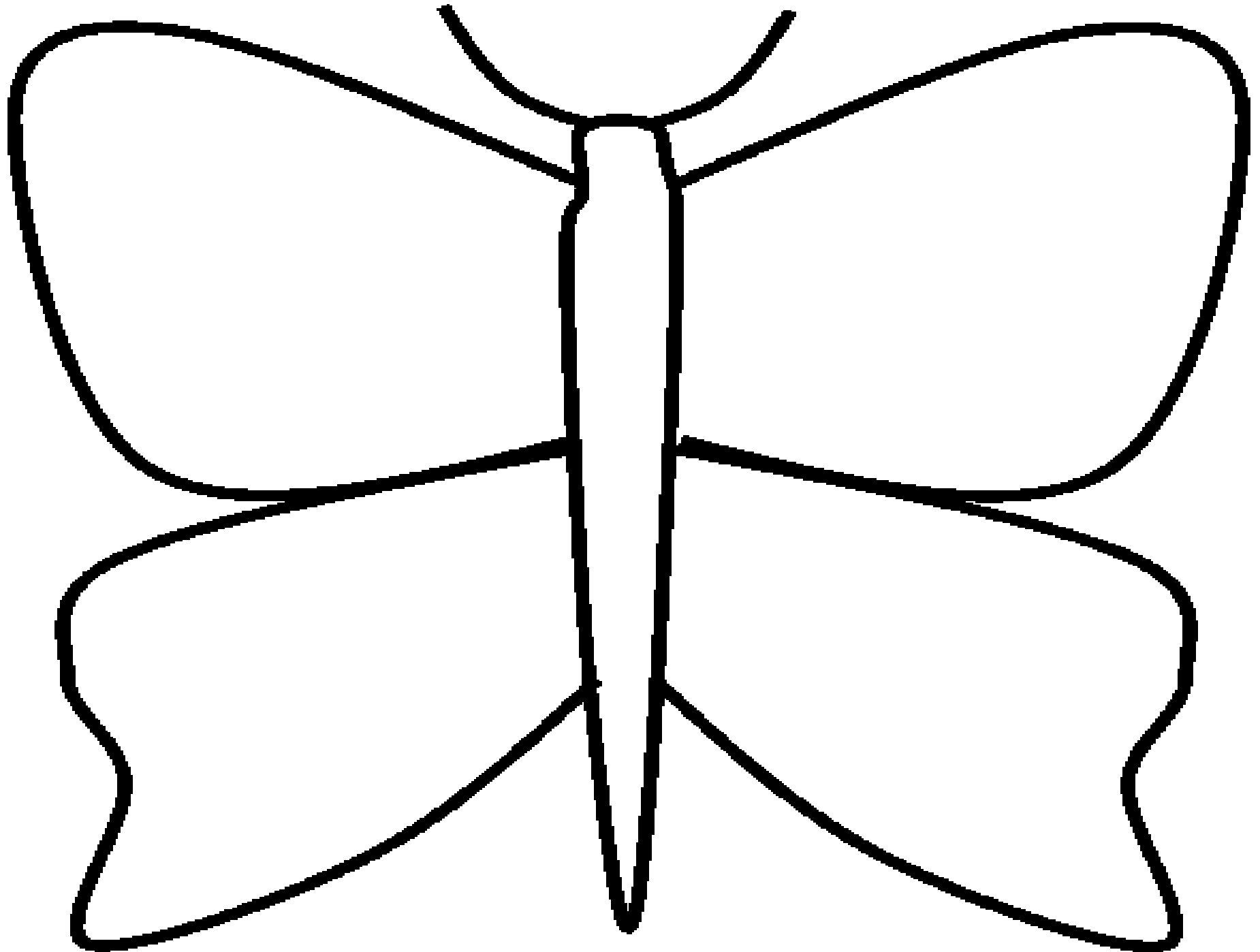
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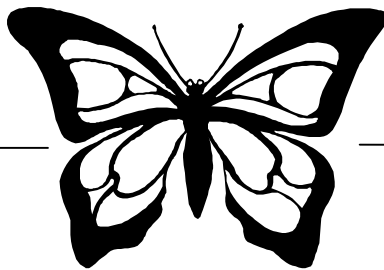
Human Life Cycle





Monarch Life Cycle

Egg



Adult
(Butterfly)



Larva
(Caterpillar)



Pupa



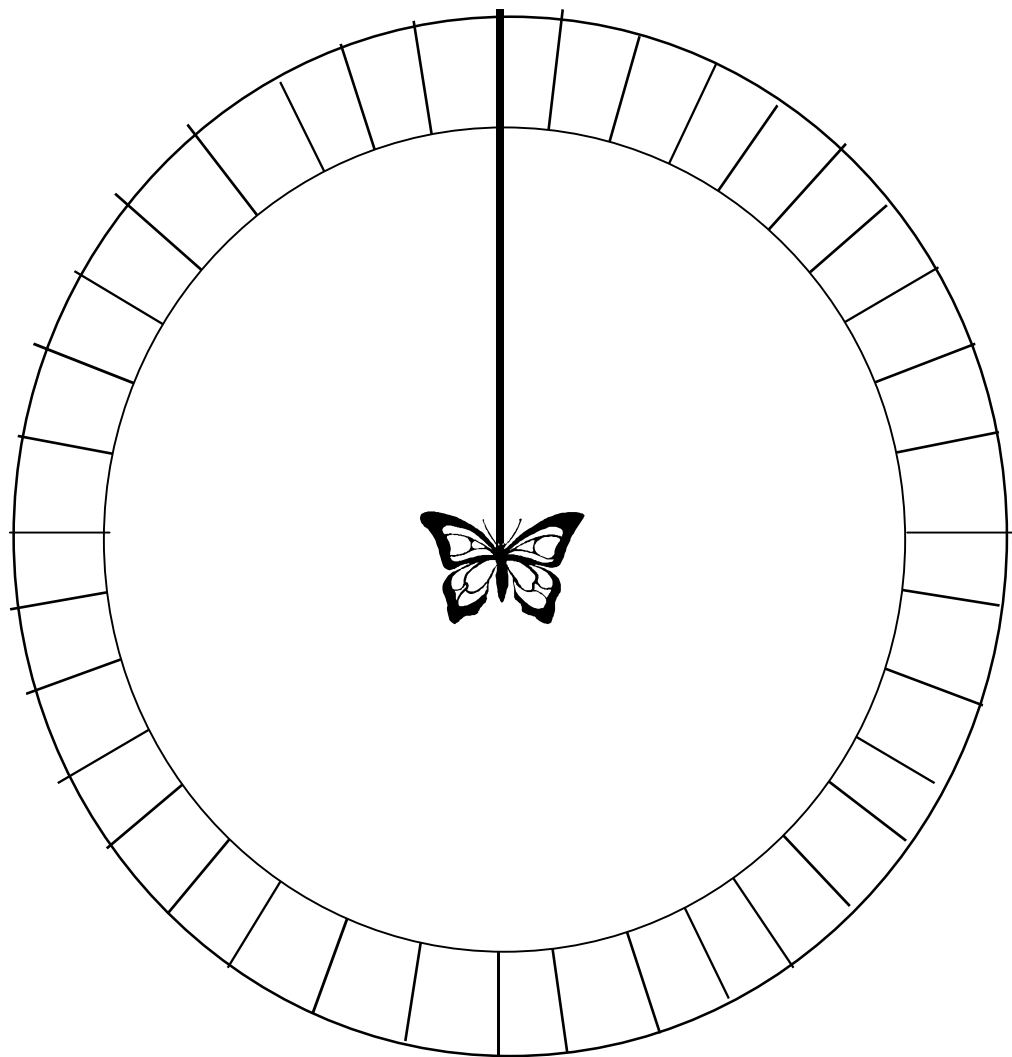
Name _____ Student Resource Sheet # 3



Life Cycle of the Monarch

Use the information below to find the number of weeks the organism spends in each cycle. Create a circle graph using the template below.

red	Egg	4 days	___ weeks
yellow	Larva	14 days	___ weeks
green	Pupa	14 days	___ weeks
blue	Adult	8 months	___ weeks



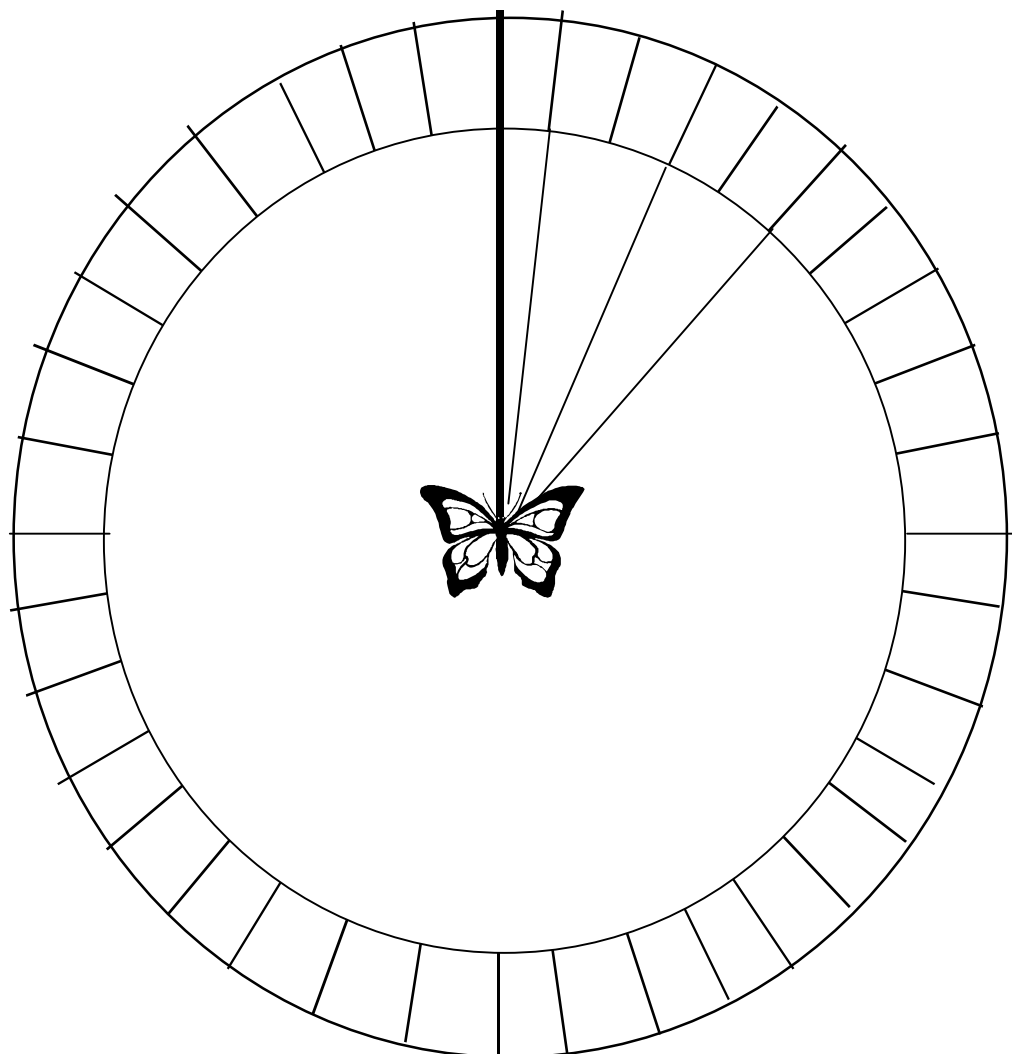
Name _____ Teacher Resource Sheet # 4



Life Cycle of the Monarch

Use the information below to find out how many weeks the organism spends in each cycle. Create a circle graph using the template below.

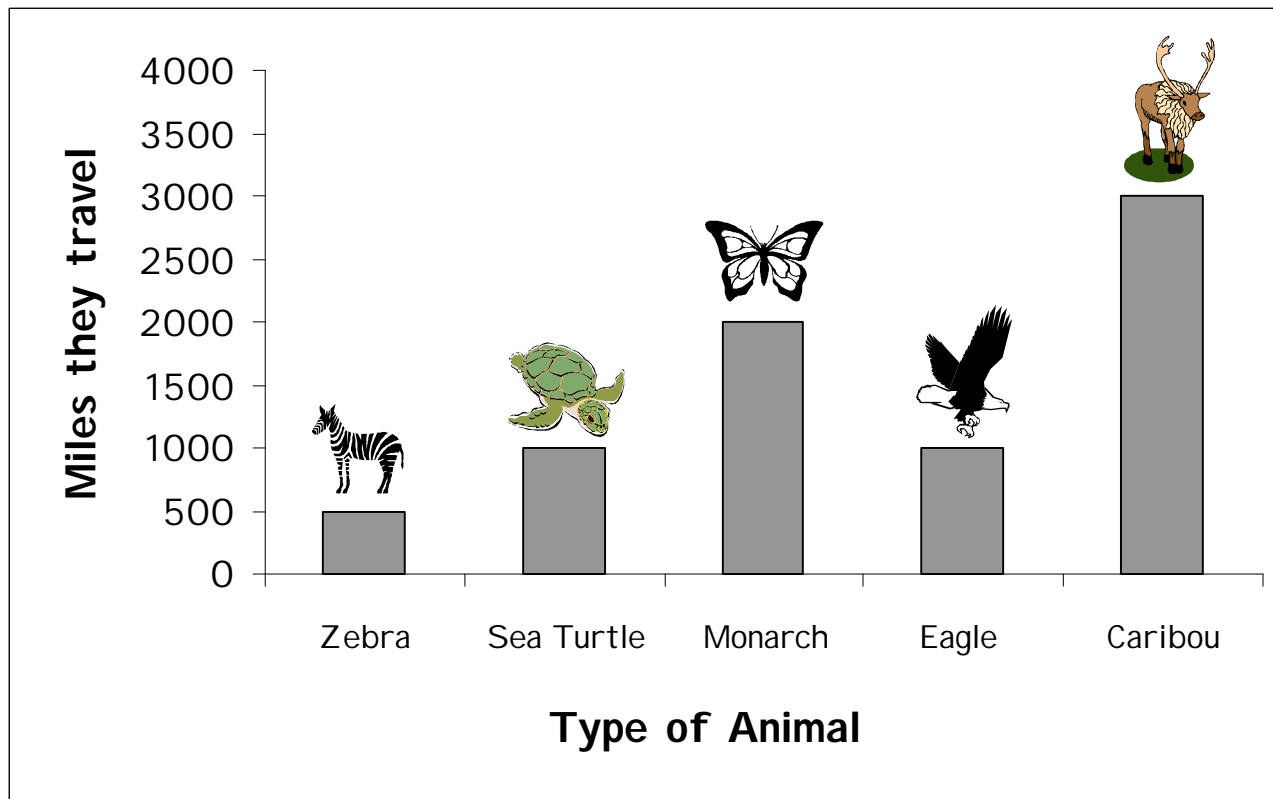
red	Egg	4 days	1	weeks
yellow	Larva	14 days	2	weeks
green	Pupa	14 days	2	weeks
blue	Adult	8 months	32	weeks



Name: _____ Student Resource Sheet # 4

Monitoring Migration

Directions: Use the graph below to answer the questions.

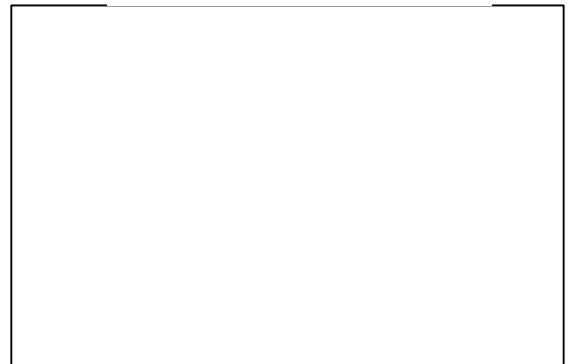


1. How many miles does the zebra travel? _____
2. How many miles does the Monarch travel? _____
3. Which animal travels the most miles? _____
4. Which animal travels the least miles? _____

5. Do any animals travel the same distance? _____

workspace

6. How many miles do the eagle and
the Monarch travel altogether?



7. How many more miles does the sea turtle travel than the zebra?

8. Which animals travel in the air? _____

How do you know? _____

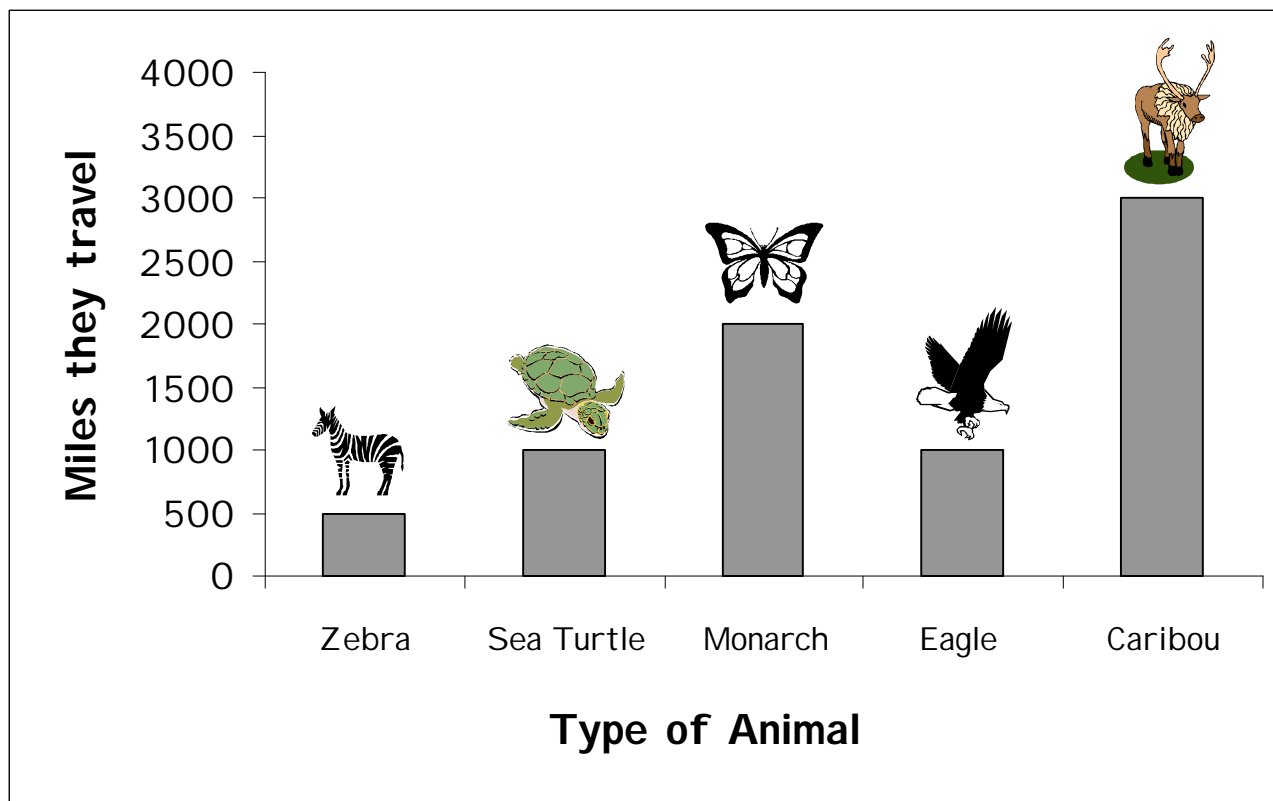
9. Which animal travels in the water? _____

How do you know? _____

Name: _____ Student Resource Sheet # 4 ANSWER KEY

Monitoring Migration

Directions: Use the graph below to answer the questions.



1. How many miles does the zebra travel? 500 miles
2. How many miles does the Monarch travel? 2000 miles
3. Which animal travels the most miles? Caribou
4. Which animal travels the least miles? Zebra

Student Resource Sheet # 4 ANSWER KEY

5. Do any animals travel the same distance? **Yes. The sea turtle and the eagle travel the same distance.**__

workspace

6. How many miles do the eagle and the Monarch travel altogether?

3000 miles

6	7
$\begin{array}{r} 2000 \\ + 1000 \\ \hline 3000 \end{array}$	$\begin{array}{r} 1000 \\ - 500 \\ \hline 500 \end{array}$

7. How many more miles does the sea turtle travel than the zebra?

500 miles

8. Which animals travel in the air? Eagle and Monarch

How do you know? (Any answer that talks about the having wings, etc.)

9. Which animal travels in the water? Sea Turtle

How do you know? (Any answer that talks about swimming.)

Name: _____ Student Resource Sheet # 5



Monarch Model Rubric



Student Rubric - Circle the number that best describes your model.

3	<ul style="list-style-type: none"><input type="checkbox"/> The model is the proper colors<input type="checkbox"/> The wings are symmetric<input type="checkbox"/> The coloring is neat
2	<ul style="list-style-type: none"><input type="checkbox"/> The model includes colors other than the proper colors<input type="checkbox"/> The wings are not completely symmetric<input type="checkbox"/> The coloring is mostly neat
1	<ul style="list-style-type: none"><input type="checkbox"/> The model does not include the proper colors<input type="checkbox"/> The wings are asymmetric<input type="checkbox"/> The coloring is not neat
0	<ul style="list-style-type: none"><input type="checkbox"/> Incomplete assignment<input type="checkbox"/> No effort present

Teacher Rubric

3	<ul style="list-style-type: none"><input type="checkbox"/> The model is the proper colors<input type="checkbox"/> The wings are symmetric<input type="checkbox"/> The coloring is neat
2	<ul style="list-style-type: none"><input type="checkbox"/> The model includes colors other than the proper colors<input type="checkbox"/> The wings are not completely symmetric<input type="checkbox"/> The coloring is mostly neat
1	<ul style="list-style-type: none"><input type="checkbox"/> The model does not include the proper colors<input type="checkbox"/> The wings are asymmetric<input type="checkbox"/> The coloring is not neat
0	<ul style="list-style-type: none"><input type="checkbox"/> Incomplete assignment<input type="checkbox"/> No effort present



Student Resource Sheet # 6

[illegible]